SPECIFICATION FOR

RECEIVER/EXCITER RT-1512/G

A3023756

REVISION -

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REGENCY SPECIFICATION
RECEIVER/EXCITER RT-1512/G

1.0 SCOPE

1.1 This specification establishes the performance, design, development and test requirements for a Tactical Ground High Frequency (HF) Receiver/Exciter (R/E) RT-1512/G, Part Number A3023756.

2.0 APPLICABLE DOCUMENTS

2.1 General

2.2 Specifications

2.2.1 Federal Specifications

TT-E-485F Thru Amend I	17 Sept. 68 18 Jul. 69	Enamel, Semigloss, Rust, Inhibiting

2.2.2 Military Specifications

MIL-E-4158E 11 Jan 1973	Electronic Equipment, Ground, General General Requirements For
MIL-M-13231A 11 Nov 1971	Marking of Electronic Items
MIL-F-14072B 19 Apr 1976	Finishes for Ground Electronic Equipment
MIL-E-15090B 29 Feb 1956	Enamel, Light Gray, (Formula No. 111)
MIL-H-49078 23 Feb 1980	Handset (H-250( )/U
MIL-R-49265(CR)	Regency Net Specification

2.3 Standards

2.3.1 Federal

FED-STD-595A 1 Feb 1980	Color Requirement for Individual Color Chips - 3 x 5 Supplements

2.3.2 Military Standards

MIL-STD-210B 15 Dec 1973	Climatic Extremes for Military Equipment
MIL-STD-275D Notice 2 10 Oct 1979	Printed Wiring for Electronic Equipment
MIL-STD-454G Notice 3 10 Sep 1981	Standard General Requirements for Electronic Equipment
MIL-STD-461A 1 Aug 1968	Electromagnetic Emission and Susceptibility Requirements for the Control of Electromagnetic Interface (plus Notice 4 of 9 Feb 1971)
MIL-STD-462 31 Jul 1967	Electromagnetic Interference Characteristics, Measurement of (plus Notice 3 of 9 Feb 1971)
MIL-STD-463	Definition and System of Units, Electromagnetic Interference Technology
MIL-STD-471 21 Mar 66	Maintainability Program Requirements (for Systems and Equipment)
MIL-STD-471A 27 Mar 73 Thru change 1 10 Jan 73	Maintainability Demonstration
DOD-STD-480A 12 Apr 78	Configuration Control-Engineering changes, Deviations and Waivers
MIL-STD-721B Notice 1 25 Aug 1966	Definitions of Effectiveness Terms for Reliability, Maintainability, Human Factors, and Safety
MIL-STD-756A 15 May 63	Reliability Prediction
MIL-STD-781C 21 Oct 77	Reliability Design Qualification & Production Acceptance Tests: Exponential Distribution

MIL-STD-785C 28 Mar 69	Reliability Program for Systems and Equipment Development and Production
MIL-STD-810C 10 Mar 75	Environmental Test Methods
MIL-STD-882A 28 June 77	System Safety Program Requirements
MIL-STD-1250 31 Mar 67	Corrosion Prevention and Deterioration Control in Electronic Components and Assemblies
MIL-STD-1474B 18 Jun 79	Noise Limits for Army Material
MIL-STD-1472B 31 Dec 74	Human Engineering Design Criteria for Military Systems, Equipment & Facilities
MIL-STD-1521A 1 Jun 76	Technical Reviews and Audits for Systems, Equipment, and Computer Programs

2.4 Other Publications

MIL-HDBK-217C 9 Apr 79	Reliability Stress and Failure Rate Data for Electronic Equipment
MIL-HDBK-472 24 May 66	Maintainability Predictions
RADC (AD-82164)	Rome Air Development Center Reliability Notebook Volume II
CSESD-15D	Communications Security Equipment Systems Document for TSEC/KY-65/75(U) (CONFIDENTIAL)

3.0 REQUIREMENTS

3.1 Item Definition

The R/E shall be a tactical HF single sideband (SSB) communications equipment for use in the Regency Net (RN) system. The R/E forms a complete HF communications system when configured with the following equipment:

(a)	Power Amplifier	A3023758
(b)	Power Supply	A3023759
(c)	Pre/Post Selector	A3023760
(d)	Antenna Coupler	A3023761

3.1.1 Item Diagram

Figure 1 shows the R/E block diagram.

3.1.2 Interface Definitions

3.1.2.1 Input Power

The R/E shall meet the requirements of this specification when supplied with 120 Vac $\pm$ 10 %, single phase, 47 to 440 Hz. The maximum input power shall be 90 VA.

3.1.2.2 Cooling

3.1.2.2.1 Forced Air

The R/E shall operate continuously at any altitude/temperature range from zero to 15000 feet and -32°C to + 63°C without any forced air cooling.

3.1.2.3 Physical Interface

3.1.2.3.1 External Wiring

Tables I through XI lists connector interface and signal characteristics.

3.1.2.3.2 Outline and Installation Characteristics

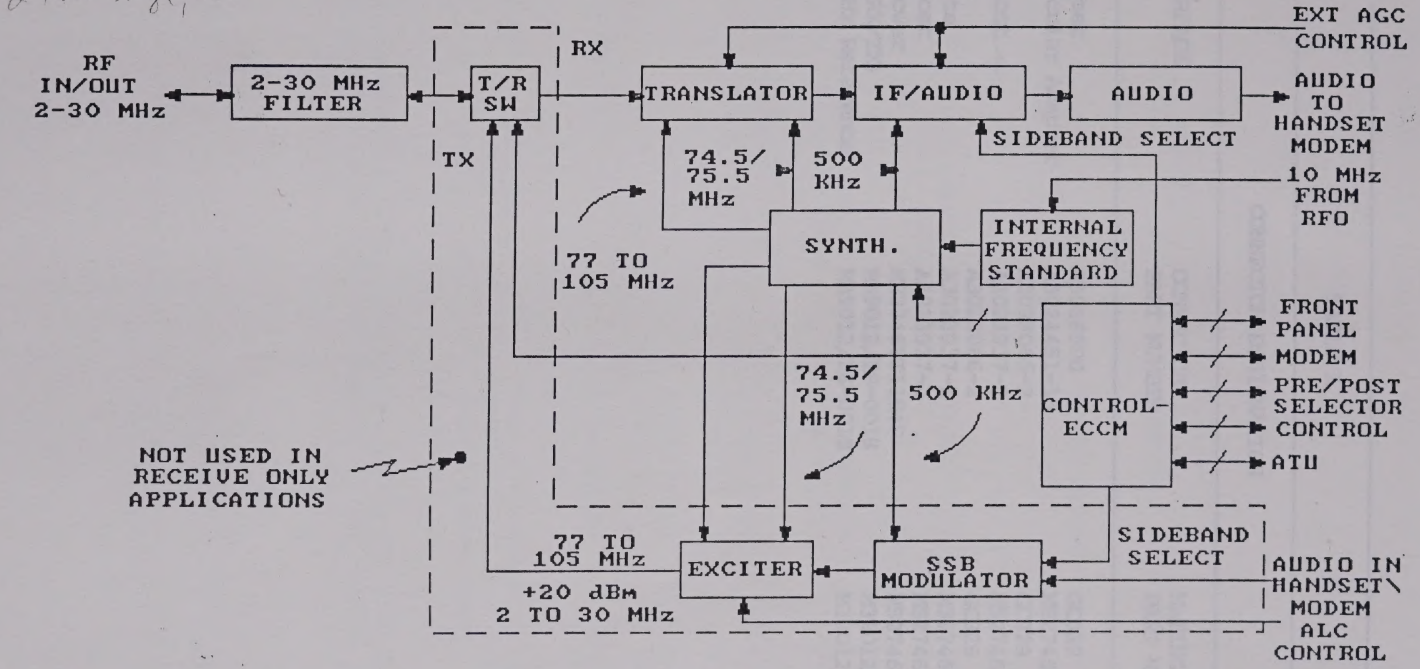
Outline drawing and installation details are shown in drawing number A3024602.

3.1.2.4 Control Interface

Control of the R/E shall be provided by either local control or remote control. Local controls shall be those on the front panel of the R/E. The remote control shall function through a front panel connector. When operating by means of remote control the R/E front panel controls shall be inoperative. Remote control or local control shall be selected by a front panel switch.

FIGURE 1

RECEIVER/EXCITER BLOCK DIAGRAM



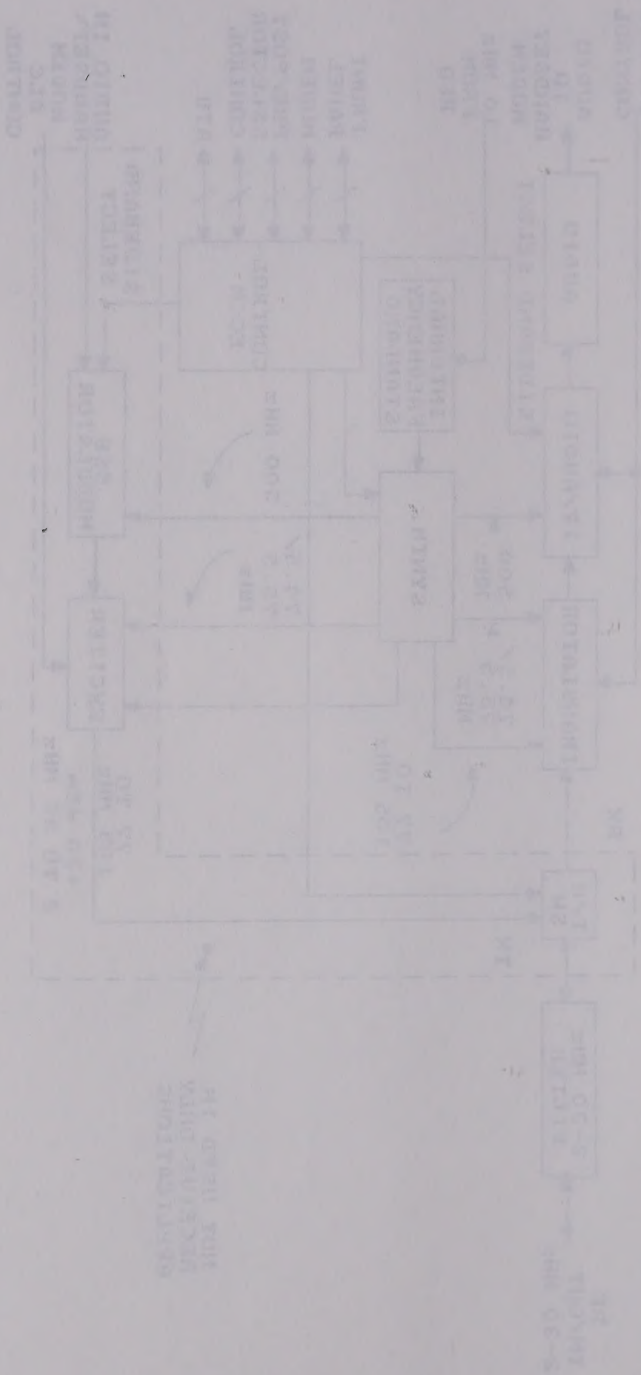


TABLE I

CONNECTOR DESIGNATION

REF DES	INTERFACE TO	CONNECTOR PART NUMBER	MATING CONNECTOR PART NUMBER
J1	Handset	A3028900	GC329
J2	Vehicular Adapter	A3024451-15	MS27467313BS
J3	KY	A3028066-2	GC329
J4	Prepost	A3023937-2	MS27467T15
J5	Fill	A3028066-2	GC329
J6	Remote	A3023937-1	MS27467317B35S
J7	Prepost	A3023937-2	MS27467T15B35S
J8	AC Power	MS27468T11B4P	MS27467T11B4S
J9	RF (RX/TX)	M39012/28-0018	M39012/26-0018
J10	10 MHz Reference	M39012/28-0018	M39012/26-0018

TABLE II

CONNECTOR "J1"

PIN NO.	LINE FUNCTION	SOURCE	LINE CONDITION	LIMIT
A	Receive Audio Common	--	Chassis Ground	--
B	Receive Audio	R/E	3 Vrms into 1K	±12 Vp-p max.
C	PTT IN	Handset or other audio device	Ground = PTT	10K pullup to +5 Vdc
D	TX Audio	Handset or other audio device	W/Compressor Enabled	2 mV balanced at 150 ohms
			W/Compressor Disabled	780 mV unbalanced at 600 ohms
E	TX Audio	Handset	W/Compressor Enabled	TX Audio Return
			W/Compressor Disabled	Grounded through 100 ohms
F	Audio Compressor Enable	Handset or other audio source	Open = Compressor Enable Ground = Compressor Disable	10K pullup to +5 Vdc

NOTE: Normally the handset or clear audio source is connected to this connector. When voice encryption device is used, the encrypted audio (Black) is connected to this connector.

TABLE III (Page 1 of 2)

CONNECTOR "J2" *

PIN NO.	LINE FUNCTION	SOURCE	LINE CONDITION	LIMIT
1	Data Bit (D_0)	R/E	--	5V CMOS Compatible
2	Data Bit (D_1)	R/E	--	5V CMOS Compatible
3	Data Bit (D_2)	R/E	--	5V CMOS Compatible
4	Data Bit (D_3)	R/E	--	5V CMOS Compatible
5	Data Bit (D_4)	R/E	--	5V CMOS Compatible
6	Data Bit (D_5)	R/E	--	5V CMOS Compatible
7	Data Bit (D_6)	R/E	--	5V CMOS Compatible
8	Data Bit (D_7)	R/E	--	5V CMOS Compatible
9	Synthesizer Bite	Vehicle Adapter	Logic 1=Pass Logic 0=Fail	5V CMOS Compatible
10	Synthesizer Strobe1	R/E	--	5V CMOS Compatible
11	Synthesizer Strobe2	R/E	--	5V CMOS Compatible
12	Spare	--	--	--
13	Spare	--	--	--
14	Spare	--	--	--
15	Synthesizer Strobe3	R/E	--	5V CMOS Compatible
16	Synthesizer Strobe4	R/E	--	5V CMOS Compatible
17	--	--	--	--

* This connector is not functional in this equipment

TABLE III (Page 2 of 2)

CONNECTOR "J2" *

18	Synthesizer Interlock	Vehicle Adapter	Ground= Synthesizer Connected	10K Pull-Up to +5Vdc in R/E
19	Synthesizer Lock	Vehicle Adapter	Logic 1=Lock Logic 0=Not Locked	5V CMOS Compatible
20	Ground	--	--	--
21	100 Watt PA Fault	Vehicle Adapter	Logic 1=Pass Logic 0=Fault	5V CMOS Compatible
22	100 Watt PA Interlock	Vehicle Adapter	Ground=100 Watt PA Connected	5V CMOS Compatible

* This connector is not function in this equipment.

TABLE IV

CONNECTOR "J3"

PIN NO.	LINE FUNCTION	SOURCE	LINE CONDITION	LIMIT
A	Receive Audio Common	--	Connected to J4-A	--
B	Receive Audio	--	Connected to J4-B	--
C	PTT	--	Ground=PTT	Internally wired to J6 pin 24. 10K pull-up to +5V
D	TX Audio	--	Connected to J4-D	--
E	TX Audio Common	--	Connected to J4-E	--
F	Spare	--	--	--

NOTE: The clear (Red) audio source is connected to this connector when voice encryption device is used.

TABLE V

CONNECTOR "J4"

PIN NO.	LINE FUNCTION	SOURCE	LINE CONDITION	LIMIT
A	Receive Audio Common	—	Connected to J3-A	—
B	Receive Audio	—	Connected to J3-B	—
C	Synchronized PTT	R/E	Logic 0=PTT	Relay Contact Closure To Ground
D	TX Audio	—	Connected to J3-D	—
E	TX Audio Common	—	Connected to J3-E	—
F	Spare	—	—	—

NOTE: When voice cnryption device is used, this connector is connected to voice encryption device red audio input.

TABLE VI

CONNECTOR "J5"

PIN NO.	LINE FUNCTION	SOURCE	LINE CONDITION	LIMIT
A	VCC OUT	R/E	+5.5 Vdc	10 mA
B	Fill Device Sense	Fill Device	Logic 1=Fill Device Connected	10K Pull Down
C	Request Fill	R/E	Logic "0" Request Fill	CMOS Compatible
D	Data	Fill Device	--	CMOS Compatible
E	Clock	Fill Device	--	CMOS Compatible
F	Shield	--	Ground	--

TABLE VII (Sheet 1 of 5)

CONNECTOR "J6"

PIN NO.	LINE FUNCTION	SOURCE	LINE CONDITION	LIMIT
1	Homing	ATU	See Figure	Open collector source, 30 Vdc max, 50 mA max
2	Next Freq 4	R/E	Next freq	+5V CMOS Compatible
3	Next Freq 3	R/E	Next freq	+5V CMOS Compatible
4	RF Tune	ATU	See Figure 4	Open collector source, 30 Vdc 50 mA max
5	Next Freq 1	R/E	Next freq	+5V CMOS Compatible
7	MP serial CLK/400W ATU ECCM Control	--	Logic 0 = ECCM Mode	Open collector source, 30 Vdc, max, 50 mA max
8	VSWR Reducer Control L5	R/E	Logic 1 = ON	Open collector source, 30 Vdc max, 50 mA max
9	Next Freq. CLK	R/E	CLK for strobing next frequency data equipment	+5V CMOS Compatible
10	Next Freq 2	R/E	Next freq	+5V CMOS Compatible
11	Transmit Audio Shield	--	--	--
12	Receive Shield	--	--	--
16	VSWR Reducer Control L3	R/E	Logic 1 = ON	See 8
17	Control Bus (-)	CIU	Differential Ctrl Data from CIU	0.2V to 5V 9600 Baud (RS-422)

TABLE VII (Sheet 2 of 5)

CONNECTOR "J6"

PIN NO.	LINE FUNCTION	SOURCE	LINE CONDITION	LIMIT
18, 15,13	Shield ground	--	Ground for cable shield	--
19	Tune Start	R/E	See Figure	Open collector source, 30 Vdc max, 50 mA max
20, 14,6	Ground	--	Chassis ground	--
21	+28 Vdc Return	--	Chassis ground	--
22	VSWR Reducer Control L4	R/E	Logic 1 = ON	See 8
23	Fine Tune Start	R/E	See Figure	Open collector source, 30 Vdc max, 50 mA max
24	PTT	Modem/Handset	Logic 0=PTT	Internally wired to J3 pin C. Load is 1K pull-up to +5 Vdc. +5V CMOS Compatible
25	Control Bus (+)	CIU	Differential Cntl Data from CIU	0.2V to 5V 9600 Baud (RS-422)
26	EXT TOD OUT	--	Not functional this equipment	--
27	Control Data-Modem to R/E(+)	Modem	Differential Cntl Data from Modem	0.2V to 5V 19200 Baud (RS-422)
28	ATU Interlock	ATU	Internally ground, ATU	--

TABLE VII (Page 3 of 5)

CONNECTOR "J6"

PIN NO.	LINE FUNCTION	SOURCE	LINE CONDITION	LIMIT
29	VSWR Reducer Control L2	R/E	Logic 1 = ON	See 8
30	ATU Bypass	R/E	See Figure 4	Open collector source, 30 Vdc max, 50 mA max
31	External Hop Clock Enable	Modem	Logic 0=Enable (also called Modem ground interlock)	Load is 10K pull-up to +5 Vdc-CMOS Compatible
32	Receive Audio	R/E	--	0 dBm into 600 ohms (W/AGC) ±12V without AGC
33	Control Data-Modem to R/E(-)	Modem	Differential Cntl Data from Modem	0.2V to 5V 19200 Baud (RS-422)
34	EXT TOD IN	--	Not functional this equipment	--
35	Address strap 4	--	Provides for independent CIU address for R/E	Ground or Open (Input 10K pulled to +5 Vdc)
36	Address strap 2	--	Provides for independent CIU address for R/E	Ground or Open (Input 10K pulled to +5 Vdc)
37	ATU Fail	ATU	Logic 0 = Fail	Open collector source, 30 Vdc max, 50 mA max
38	Hop Clock (+)	Modem	Differential Sig. for Hop Clock	0.2V to 5V (RS-422)
39	Hop Clock (-)	Modem	Differential Sig. for Hop Clock	0.2V to 5V (RS-422)

TABLE VII (Page 4 of 5)

CONNECTOR "J6"

PIN NO.	LINE FUNCTION	SOURCE	LINE CONDITION	LIMIT
40	Squelch indicate	--	Not functional this equipment	--
41	Control Data-R/E to Modem (-)	R/E	Differential Cntl Data to Modem	0.2V to 5V 19200 Baud (RS-422)
42	Control Data-R/E to Modem (+)	R/E	Differential Cntl Data to Modem	0.2V to 5V 19200 Baud (RS-422)
43	Address strap 3	--	Provides for independent CIU address for R/E	Ground or Open (Input 10K pulled to +5 Vdc)
44	VSWR Reducer Control L1	R/E	Logic 1 = ON	Sta 8
45	1 pulse/sec (-)	RFO	Differential Clock from RFO	0.2V to 5V
46	1 pulse/sec (+)	RFO	Differential Clock from RFO	0.2V to 5V
47	Receive Audio Ret.	R/E	--	--
48	Battery Test	R/E	Test keep alive battery	--
49	Transmit Audio Ret.	--	--	--
50	External AGC	Modem	0V = Max. Gain 5V = Min. Gain (1.5V to 3.5V typical range)	Slope=100dB/volt Input resistance= 3K
51	Address strap 1	--	Provides for independent CIU address for R/E	Ground or Open (Input 10K pulled to +5 Vdc)
52	Equipment Status(-)	R/E	Differential Data to CIU	0.2V to 5V

TABLE VII (Page 5 of 5)

CONNECTOR "J6"

PIN NO.	LINE FUNCTION	SOURCE	LINE CONDITION	LIMIT
53	Transmit Audio	—	Data Mode	0 dBm into 600 ohms (3 KHz Bandwidth)
54	Spare	—	—	—
55	Equipment Status(+)	R/E	Differential Data to CIU	0.2V to 5V

TABLE VIII (Page 1 of 3)

CONNECTOR "J7"

PIN NO.	LINE FUNCTION	SOURCE	LINE CONDITION	LIMIT
1-5	Spare	--	--	--
6	~~Serial data CLK~~/400	ATU	--	--
7	Receiver AGC	R/E	--	--
8	Chassis Ground	--	--	--
9	~~Pre-Post Selector~~	--	--	--
10	Push-To-Talk (PTT)	R/E	Logic 0=PTT	Open Collector to 30 Vdc (10 mA sink)
11	Muting in Tune	Pre-Post	Logic 0=Tune	Open collector to 30 Vdc (10 mA sink)
12	Pre-Post Selector	R/E	Logic 0=Override	Open collector to 30 Vdc (10 mA sink)
13	Pre-Post Selector	Pre-Post	Logic 0=Fail	Open collector to Fail 30 Vdc (10 mA sink)
14	Power Supply Fail	Pre-Post	Logic 0=Fail	Open Collector to 30 Vdc (10mA sink)
15	Power Amp. Fail	Pre-Post	Logic 0=Fail	Open Collector to 30 Vdc (10mA sink)
16	Power Amp. Ground Interlock	Pre-Post	Ground = Power Amplifier connected	--
17	Power Reduction (Thermal)	Pre-Post	Logic 0=Reduce Pwr	Open Collector to 30 Vdc (10 mA sink)

TABLE VIII (Page 2 of 3)

CONNECTOR "J7"

PIN NO.	LINE FUNCTION	SOURCE	LINE CONDITION	LIMIT
18	Shield	--	--	--
19	Reflected Power	Pre-Post	0 Vdc=No Power 1 Vdc=40 Watt	Operational Amplifier Output
21	Forward Power	Pre-Post	3 Vdc = 400 Watts (Linear above 60W)	Operational Amplifier Output
22	Shield	--	--	--
22	Power Code 1	R/E	--	TTL
23	Power Code 2	R/E	--	--
24	10 KHz Code 8	R/E	BCD Code	"0" can sink 10 mA "1" 1K pull-up to 5V
25	10 KHz Code 4	R/E	BCD Code	"0" can sink 10 mA "1" 1K pull-up to 5V
26	10 KHz Code 2	R/E	BCD Code	"0" can sink 10 mA "1" 1K pull-up to 5V
27	10 KHz Code 1	R/E	BCD Code	"0" can sink 10 mA "1" 1K pull-up to 5V
28	100 KHz Code 8	R/E	BCD Code	"0" can sink 10 mA "1" 1K pull-up to 5V
29	100 KHz Code 4	R/E	BCD Code	"0" can sink 10 mA "1" 1K pull-up to 5V
30	100 KHz Code 2	R/E	BCD Code	"0" can sink 10 mA "1" 1K pull-up to 5V

TABLE VIII (Page 3 of 3)

CONNECTOR "J7"

PIN NO.	LINE FUNCTION	SOURCE	LINE CONDITION	LIMIT
31	100 KHz Code 1	R/E	BCD Code	"0" can sink 10 mA "1" 1K pull-up to 5V
32	1 MHz Code 8	R/E	BCD Code	"0" can sink 10 mA "1" 1K pull-up to 5V
33	1 MHz Code 4	R/E	BCD Code	"0" can sink 10 mA "1" 1K pull-up to 5V
34	1 MHz Code 2	R/E	BCD Code	"0" can sink 10 mA "1" 1K pull-up to 5V
35	1 MHz Code 1	R/E	BCD Code	"0" can sink 10 mA "1" 1K pull-up to 5V
36	10 MHz Code 2	R/E	BCD Code	"0" can sink 10 mA "1" 1K pull-up to 5V
37	10 MHz Code 1	R/E	BCD Code	"0" can sink 10 mA "1" 1K pull-up to 5V

TABLE IX

CONNECTOR "J8"

PIN NO.	LINE FUNCTION	SOURCE	LINE CONDITION	LIMIT
A	Primary Power	--	120 Vac, ± 10%	90 vA MAX.
B	Neutral	--	47 to 440 Hz	
C	Ground	--	Chassis Ground	--
D	Spare	--	--	--

TABLE X

CONNECTOR "J9"

PIN NO.	LINE FUNCTION	SOURCE	LINE CONDITION	LIMIT
--	Receiver Exciter RF input/output	--	Transmit Mode	±24 dBm, 50 ohm impedance nominal
			Receive Mode	50 ohm impedance nominal

TABLE XI

CONNECTOR "J10"

PIN NO.	LINE FUNCTION	SOURCE	LINE CONDITION	LIMIT
--	10 MHz Reference Frequency Input	RFO	Sinewave	.3Vrms into 50 ohms (50 ohms externally supplied)

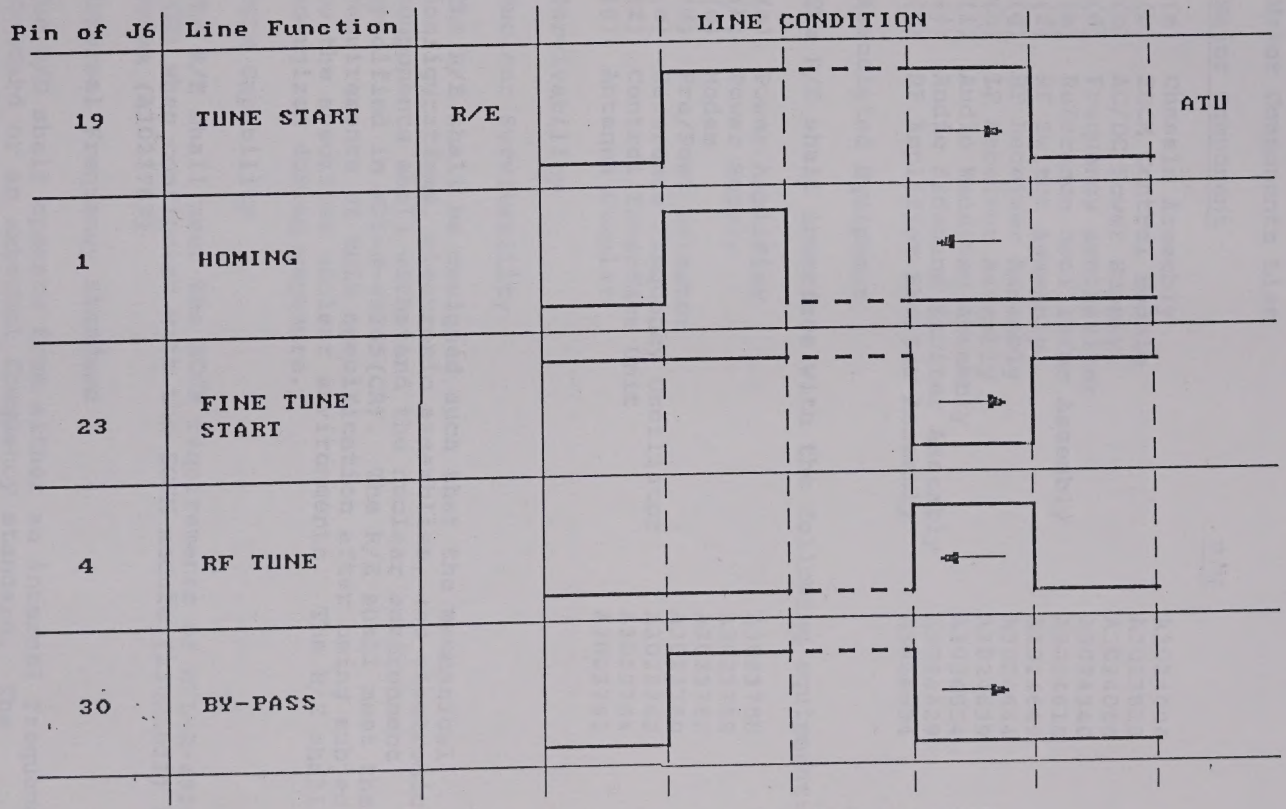


FIGURE 4 - ATU TIMING RELATIONSHIP

3.1.3 Major Components List

Major Component		P/N
(a)	Chassis Assembly	A3024604
(b)	ECCM Control Module	A3023813
(c)	AC/DC Power Supply	A3024060
(d)	Frequency Synthesizer	A3024340
(e)	Reference Oscillator Assembly	A3024618
(f)	RF Switch Assembly	A3024649
(g)	RF Receiver Assembly	A3024644
(h)	IF Receiver Assembly	A3024639
(i)	Audio Receiver Assembly	A3024654
(j)	Audio Sideband Exciter Assembly	A3024629
(k)	RF Amplifier Exciter Assembly	A3024634

3.1.4 Associated Equipment

The R/E shall interface with the following equipment:

(a)	Power Amplifier	A3023758
(b)	Power Supply	A3023759
(c)	Modem	A3023769
(d)	Pre/Post Selector	A3023760
(e)	Reference Frequency Oscillator	A3023762
(f)	Control Interface Unit	A3023764
(g)	Antenna Coupler	A3023761

3.1.5 Survivability

3.1.5.1 Nuclear Survivability

The R/E shall be designed such that the mechanical configurations, electronic assemblies, and electronic components shall withstand the nuclear environment specified in MIL-R-49265(CR). The R/E shall meet the requirements of this specification after being subjected to the specified nuclear environments. The R/E shall be energized during exposure.

3.1.6 ECCM Capability

The R/E shall meet the ECCM requirements of MIL-R-49265 (CR) when configured with the ECCM module (A3023831) and Modem (A3023769)

3.1.7 External Frequency Standard

The R/E shall operate from either an internal frequency standard or an external frequency standard. The external frequency standard shall be nominally 10 MHz at 0.1 to 1 volts RMS into 50 ohms. (The 50 ohm load must be supplied externally). When the external frequency standard is supplied to the R/E at the specified level,

the internal frequency standard shall be automatically disabled.

3.1.8 Warmup Period

Under any combination of environmental, service or operational conditions specified herein, the R/E, with the exception of the transmitter frequency accuracy, shall be cable of meeting the requirements of this specification within ten seconds after turn ON. When operating from the internal frequency standard, the transmitter frequency accuracy shall be within five parts in 10^6 within ten seconds after turn ON and shall be within two parts in 10^6 within 240 seconds after turn ON. When operating from the external frequency standard, the frequency accuracy shall be equal to that of the external standard.

3.1.9 Microphonics and Other Noise

The R/E shall be designed and constructed so that microphonics or other noises which can modulate the carrier or interfere with the receiver audio output shall not exist within the unit.

3.1.10 Case Temperature

No spot on the R/E case shall exceed a temperature of 42°C (180°F) after 30 minutes of continuous operation. This requirement shall be met at 25°C ambient air conditions. Under any service conditions, no accessible spot on the R/E shall exceed a temperature which would constitute a safety hazard to operating personnel.

3.1.11 Protective Circuitry

3.1.11.1 Antenna Input Circuits

The R/E shall contain protective devices in the antenna input circuits to isolate the input stages of the receiver from destructive transients. The protective devices shall provide a non-resonant static discharge path that does not degrade receiver sensitivity. The total range of protection required for the antenna input circuits shall be for any transient level up to and including one watt.

3.2 Characteristics

3.2.1 Performance

3.2.1.1 Frequency Characteristics

3.2.1.1.1 Frequency Range

The R/E shall be capable of transmitting and receiving over the following frequency band:

2.0000 through 29.9999 MHz for a total of 280,000 channel frequencies in 100 Hz steps.

All channels shall be available without the necessity of changing any component or manually adjusting any circuit. When a channel has been selected both the transmitter and receiver circuits shall automatically adjust for operation on that frequency.

3.2.1.1.2 Frequency Stability

3.2.1.1.2.1 Short Term Stability

The R/E shall provide a short term stability equivalent to an RMS frequency deviation of 15 Hz.

3.2.1.1.2.2 Long Term Stability

The suppressed carrier of the exciter and all receiver local oscillators shall be referenced to a single temperature compensated crystal oscillator (TCXO) with an accuracy of $\pm 2 \times 10^{-6}$ over the operating temperature range of $-30^{\circ}C$ to $+63^{\circ}C$. When supplied with an external frequency standard, the suppressed carrier of the exciter and all receiver local oscillators shall be referenced to the external standard.

3.2.1.1.3 Settling Time

The R/E shall settle to within 100 Hz of a new 100 Hz center frequency within 0.4 milliseconds for any frequency step of less than 1 MHz in the range of frequencies specified in paragraph 3.2.1.1.1.

3.2.1.1.4 Command Rate

The R/E shall accept digital frequency change at rates compatible with the ECCM mode.

3.2.1.1.5 Warmup Time

Settling time, command rate, frequency accuracy and short term stability shall be satisfied after a 4 minute warm up period.

3.2.1.2 Exciter Characteristics

3.2.1.2.1 Types of Transmission

The Exciter shall provide the following types of transmissions:

(a) A3J (USB, LSB) voice, encrypted voice, or data.

(b) Continuous Tone

3.2.1.2.2 Power Output

Nominal RF power into a 50 ohm resistor dummy load shall be +24 dBm minimum CW or peak envelope power (PEP).

3.2.1.2.3 Power Output vs Operating Conditions

With a constant audio input tone, the +24 dBm minimum power output shall be maintained over the complete tuning range of the transmitter with any combination of input voltage and temperature in the range -32°C to 63°C with the automatic level control (ALC) signal held constant.

3.2.1.2.4 Duty Cycle

The R/E shall be capable of continuous key-down operation.

3.2.1.2.5 Continuous Tone

The Continuous Tone signal shall consist of a 1000 ±100 Hz tone that will result in USB or LSB signal is selected. The continuous tone signal shall be front panel activated.

3.2.1.2.6 Spurious Outputs

The level of RF emissions other than the desired output frequencies shall be in conformance with the

following when the R/E is loaded into a 50 ohm resistive load:

(A) Suppressed carrier at least 40 dB below the PEP.

(B) Unwanted sideband at least 45 dB below the PEP (except intermodulation distortion (IMD) products).

(C) Intra and adjacent channel intermodulation and harmonic distortion products produced either in audio or RF circuits shall be at least 30 dB below either of two equal amplitude tones separated in frequency by 100 Hz or greater, modulating the transmitter to an output level up to +24 dBm PEP minimum.

(D) Other spurious products shall be at least 70 dB below PEP.

(E) The second harmonic output of the Exciter shall be at least 30 dB below PEP.

3.2.1.2.7 Hum

Hum and ripple shall be at least 40 dB below the output level of a single tone modulating the transmitter to rated peak envelope power output.

3.2.1.2.8 In-Band Noise Level

With no modulation the in-band noise measured in a 50 Hz bandwidth shall be at least 40 dB below rated single tone output.

3.2.1.2.9 Audio Input

The Exciter section of the R/E shall be capable of providing rated RF output with any of the following inputs:

(a) Handset Input (modified H-250): Output as specified in MIL-H-49078 except that audio signal and return are on pins D and E respectively of the handset connector.

(b) Encrypted Audio Signals (KY-75): Output as specified in CSESD-15D (0 dBm $\pm$ 1 dB at 600 ohms).

(c) Modem Data Signals: 0 dBm $\pm$ 1 dB at 600 ohms.

(d) Voice/TTY Mode: Voice signals as specified in (a) or (b) simultaneously with 75 bps FSK data as specified in (c) with a center frequency of 2805 Hz and a frequency shift of 85 Hz.

3.2.1.2.10 Overall transmitter Frequency Response

Overall transmitter frequency response shall be defined as that from the audio input to the RF output. The passband characteristics shall be as follows:

(a) USB: From carrier +300 Hz to carrier +3100 Hz, 3 dB maximum from peak. At carrier -700 Hz and carrier +4400 Hz, 50 dB minimum from peak. The passband ripple from carrier +500 Hz to carrier +2900 Hz shall not exceed 2.5 dB.

(b) LSB: From carrier -300 Hz to carrier -3100 Hz, 3 dB maximum from peak. At carrier +700 Hz and carrier -4400 Hz, 50 dB maximum from peak. The passband ripple from carrier to -500 Hz to carrier -2900 Hz shall not exceed 2.5 dB.

3.2.1.2.11 Sidetone

The R/E shall be equipped to monitor transmissions by sidetone in the clear voice mode. The sidetone level, with the transmitter modulated to the full output, shall be adjustable by means of an internal control which is accessible in maintenance, to a minimum level of .5 mW with a volume control adjusted to maximum. Sidetone level shall be adjusted in production 0.5 mW $\pm$ 3 dB and shall remain within this tolerance under all conditions of supply voltage and operating temperature range specified. The internal adjustment shall allow a minimum of 12 dB attenuation relative to .5 mW.

3.2.1.2.12 Audio Compression

When the modified H-250 handset (see para 3.2.1.2.9.a) is connected to the R/E, an audio compression circuit shall be activated such that audio input signals in the range 2 mV to 20 mV will cause the R/E to have rated RF power output (see para 3.2.1.2.2). For encrypted audio signals and modem data signals (para 3.2.1.2.9.b and 3.2.1.2.9.c) the audio compression circuit shall be by passed.

3.2.1.2.13 Automatic Level Control (ALC)

The R/E shall have an ALC control such that when the R/E is operated in conjunction with the 400 Watt Power Amplifier (A3023758) and Pre/Post Selector (A3023760) the output power can be maintained to 400 watts, 100 watts, or 25 watts. The RF output power level which can be selected remotely or locally shall be maintained to the selected level $\pm$ 1 dB for 50 ohm terminations. The ALC loop shall maintain the forward power sample voltage to +6 Vdc until the reflected power sample voltage is +1 Vdc maximum. The RF power from the R/E shall be adjusted so that the reflected power sample voltage does not exceed +1 Vdc. The sense of the forward and reflected power samples is positive (increasing power results in increasing voltage).

The ALC loop shall be capable of adjusting the RF power level out of the R/E over the minimum range +14 dBm to +24 dBm in the 400 watt mode, 8 dBm to +16 dBm in the 100 watt mode, and 2 dBm to 10 dBm in the 25 watt mode.

In voice mode, the ALC loop time constants shall nominally be 15 milliseconds (attack) and 750 milliseconds (release).

In the ECCM mode, the ALC characteristics shall not distort the ECCM waveform.

3.2.1.2.14 R/E Output Impedance

The R/E output impedance shall be such that the requirements of paragraph 3.2.1.2.13 are met for load VSWR ranging form 1.0:1 to 2.5:1 relative to 50 ohms.

3.2.1.3 Receiver Requirements

3.2.1.3.1 Modes of Reception

The Receiver shall provide the following types of receptions:

(a) A3J (USB, LSB) voice, encrypted voice or data.

3.2.1.3.2 Sensitivity

The output signal-plus-noise ratio shall be at least 10 dB when a single sideband modulated radio frequency (RF) signal of -110 dBm in the frequency

range 2.0000 to 29.9999 MHz is applied to the receiver input terminals.

3.2.1.3.3 Overall Selectivity

Overall selectivity of the receiver shall be defined as that from antenna connection to audio output. The passband characteristics shall be as follows:

(a) USB: From carrier +300 Hz to carrier 3100 Hz: 3 dB maximum from peak; at carrier -700 Hz and carrier +4400 Hz: 50 dB minimum from peak; Passband ripple less than 2.5 dB from carrier +500 Hz to carrier +2900 Hz.

(b) LSB: From Carrier -300 Hz to carrier -3100 Hz: 3 dB maximum from peak; at carrier +700 Hz and carrier -4400 Hz, 50 dB minimum from peak; Passband ripple less than 2.5 dB from carrier -500 Hz to carrier -2900 Hz.

3.2.1.3.4 Envelope Delay Distortion

The differential delay distortion across the receiver passband shall not exceed 500 microseconds for audio modulation frequencies from 600 Hz to 2800 Hz. The reference delay shall be at the frequency of minimum delay across the receiver passband.

3.2.1.3.5 Automatic Gain Control (AGC) Characteristics

3.2.1.3.5.1 External AGC Control

When the Receiver is operating in conjunction with the modem (A3023769), the receiver AGC voltage shall be supplied by the Modem. The sense of the AGC volts shall be positive for decreasing gain. The nominal slope of the AGC voltage shall be 100 dB/volt with approximately 1.5 Vdc corresponding to maximum gain and approximately 3.5 Vdc corresponding to minimum gain. The external AGC input resistance shall be nominally 3K ohm.

3.2.1.3.5.2 Internal AGC Control

The internal AGC control shall operate when the Receiver is not connected to the Modem. The internal AGC control shall have a nominal attack time of 30 milliseconds and a nominal release time of 600 milliseconds to 1 second. Attack time and

release time are defined as the time interval required for the audio output level to stabilize to within 3 dB of its final valve, when measured from application or removal, respectively, of a 40 dB input signal change with a minimum input signal of 3 microvolts. The AGC characteristic shall be such that the audio output change shall be less than 4 dB for an RF input change from 3 microvolts to 1 volt.

3.2.1.3.6 Internally Generated Spurious Outputs

With the receiver antenna connections terminated in a shielded 50 ohm resistor, spurious responses shall not exceed the requirements of (a) and (b) below except spurious responses caused by the reference oscillator and its harmonics shall not exceed a SINAD of 25 dB.

(a) No internally generated spurious output shall exceed a SINAD of 20 dB.

(b) No more than 30 internally generated spurious outputs from both sidebands (total) shall be greater than a SINAD of 3 dB and of these no more than 10 shall be greater than SINAD of 10 dB.

3.2.1.3.7 External Single-Signal Spurious Responses

The receiver shall exhibit the following performance with regard to rejection of undesired signals.

3.2.1.3.7.1 In-band Intermodulation distortion

Intermodulation distortion products produced when the receiver processes two unmodulated radio frequency signals producing audio outputs at 1000 and 1100 Hz shall each be a minimum of 30 dB below the reference output tones. The requirement shall be met over an input signal amplitude range of 1 microvolts to 100 millivolts, per tone, and for audio output level set to maximum.

3.2.1.3.7.2 Front-end Intermodulation Distortion

The receiver shall exhibit the specified front-end intermodulation performance for any operating mode. Two unmodulated RF signals of equal amplitude shall be applied to the receiver input terminals in such a relationship that $mF_1 \pm nF_2 = f_0 \pm 1000$ Hz, and adjusted in amplitude to produce an audio output SINAD of 10 dB in the appropriate sideband. For

the case where both signals are within the first IF 3 dB bandwidth, but outside the final IF band, the minimum signal level required to produce a 10 dB output SINAD shall be -57 dBm per tone.

For both tones outside the first IF 40 dB bandwidth, but within the range included between 0.7 F_L and 1.4 F_H, the minimum signal level required to produce a 10 dB output SINAD shall be -35 dBm per tone. For either or both tones outside the range included between 0.7 F_L and 1.4 F_H, the minimum signal level required to produce a 10 dB output SINAD shall be -13 dBm.

3.2.1.3.7.3 Desensitization

The Receiver shall exhibit the following performance with regard to desensitization by unmodulated out-of-band signal. The audio output SINAD established by a desired in-band-signal of -100 dBm shall not be degraded by more than 2 dB in the presence of an interfering signal level of +0 dBm separated from the desired signal by 2 MHz or more in the 2 to 30 MHz band.

3.2.1.3.7.4 Cross Modulation

Cross modulation shall be less than 10% when measured under the following conditions:

(a) Desired signal: -67 dBm input level

(b) AM, 80% modulated interfering signal of -1 dBm peak input level at least 40 KHz removed from the desired signal.

3.2.1.3.7.5 Protection

The receiver shall be capable of withstanding up to 1 Watt continuously without causing damage. This requirement shall be met at resonant, tuned conditions in addition to any other combination of frequency and tune status and applies for the receiver operating with or without the Pre/Post Selector.

3.2.1.3.7.6 Image Rejection

The Image Rejection shall be better than 80 dB.

3.2.1.3.7.7 IF Rejection

The IF Rejection shall be better than 80 dB.

3.2.1.4 Integral ECCM Characteristics

3.2.1.4.1 ECCM Module

The R/E shall meet the ECCM requirements of Specification MIL-R-49764 (cr) system when the ECCM module is installed. The ECCM module shall accept inputs from the I/O (A3023763) and Modem (A3023769) through the remote connector of the ECCM Module. The ECCM module shall control the R/E frequency synthesizer, sideband filter selection, audio compression circuit bypass, AGC mode, receiver blanking control, transmitter ALC and transmitter keying.

3.2.1.4.2 Dual Sideband Filters

In the ECCM receive mode, dual sideband filters or the functional equivalent shall be provided. The filters shall alternate every hop time and switching shall occur in less than 400 microseconds. The inputs and outputs of the filter not in use shall be shunted to ground through their characteristic impedance. The switching between the dual sideband filters shall be free from switching signals and their harmonics and other spurious or objectional interferences.

3.2.1.4.3 ECCM Tone Waveform

The ALC loop in the transmitter shall be capable of supporting the ECCM waveform.

3.2.1.4 Transmitter and Receiver Blanking

During synthesizer settling in the ECCM mode, the transmitter and receiver are to be blanked. The duration of the blanking pulse can vary from 400 microseconds to 40 milliseconds. The blanking pulse will be supplied at the time a new frequency command is given.

3.2.1.4.5 Transmitter Keying

Transmitter keying action shall require less than 800 microseconds and the transmitter shall not emit in the absence of audio.

3.2.1.5 Built-in Test Equipment (BITE)

The R/E shall contain BITE which when operating in conjunction with the Power Amplifier, Pre/Post Selector and Antenna Tuning Unit will permit fault isolation to the unit and module level.

3.2.1.5.1 Continuous Monitor

Functions which can be continuously monitored without effecting normal system operation, shall be used to provide a continuous on-line BITE.

3.2.1.5.2 BITE Test

Those functions which cannot be monitored on a continuous basis shall be tested in an off-line test that is operator initiated.

3.2.1.5.2.1 BITE Initiate

The off-line BITE shall be initiated either by a local control on the front panel of the R/E or by remote control.

3.2.1.5.3 BITE Indicator

A BITE indicator shall be located on the front panel. The indicator shall provide a NO FAULT or FAULT condition. The BITE indicator status shall also be provided at a pin on the Remote Connector.

3.2.2 Physical Characteristics

3.2.2.1 Construction

The R/E shall be constructed in an equipment case that mounts in a standard 19 inch rack. The equipment case shall be provided with chassis slides that have a tilt capability for maintenance. The case shall provide electrical connectors for all inputs and outputs required including the ECCM module.

3.2.2.2 Controls and Indicators

The front panel of the R/E shall provide all external controls and indicators necessary for the proper functioning of the equipment. As a minimum, the R/E panel shall incorporate the following controls and indicators including those on the ECCM module.

A. An ON/OFF switch which shall connect AC power to the receiver/exciter.

B. A pilot lamp which shall indicate when AC power is connected to the receiver/exciter.

C. A local remote switch which provides for local operation of the receiver/exciter from the front panel controls or permits remote operation.

D. A zeroize switch which permits zeroing of all variables within the ECCM module.

E. A volume control which adjusts the level of receive audio to the handset connector.

F. A tactile keyboard shall be provided which provides for the following functions.

-- Frequency selection including digits 0 - 9.

-- A load key which permits loading of variables into the ECCM module.

-- A key which permits increasing the frequency of the receiver/exciter in steps of 100 Hz.

-- A key which permits decreasing the frequency of the receiver/exciter in steps of 100 Hz.

-- A sideband selection key.

-- A transmitter power selection key.

-- A continuous tone key which keys the exciter and modulates the exciter output with a 1000 Hz tone.

-- A PRESET key which enables the loading of frequencies into a preset channel memory

-- A CLEAR key which permits corrections of keyboard entry errors

-- An ENTER key which terminates each keyboard entry.

-- A 2nd function key which enables multifunction keys

G. The receiver/exciter shall have a liquid crystal display which shall indicate the frequency selected, the sideband selection, the transmitter power level, the continuous tone mode, the variable selection mode, a tuning indicator, and a FAIL indicator to indicate results of built-in tests. The display shall be back lighted for night operation. The backlighting shall automatically illuminate when a key function is selected and it

shall remain on for approximately 30 seconds after the last keyboard function is selected. To enable the back light without changing any functions of the receiver/exciter, the ENTER key may be depressed.

3.2.2.3 Connectors

The receiver/exciter shall provide for the following connections on the front panel.

A. AC power connector

B. Pre/post selector connector

C. Audio handset connector

D. Remote connector

E. KY connector

F. SYNC connector

G. Vehicle adapter connector

3.2.2.5 Weight

The receiver/exciter including ECCM module shall weigh no more than 39.5 pounds.

3.2.2.6 Dimensions

The receiver/exciter shall have the following dimensions excluding protuding knobs and handles width 16.75 inches, length 16.38 inches, and height 5 inches; the front panel shall be 19 inches wide and 5.22 inches high.

3.2.3 Reliability

The receiver/exciter unit shall have an MTBF of at least 5000 hours calculated according to MIL-HDBK-217D for 90% ground fixed equipment operating at +43C and 10% ground mobile operating at +35C.

3.2.4 Maintainability

The receiver/exciter shall have a meantime to repair (MTTR) of no greater than 15 minutes. and a maximum time to repair of no greater than 30 minutes at the 95th percentile intermediate level of maintenance. Repair action at this level shall consist of replacing modules.

3.2.5 Service Conditions

The equipment shall be capable of meeting the requirements under the following service conditions.

(A)	Low Temperature	MIL-STD-810C Method 502.1, Procedure I -21°C (operating) - 33°C (storage)
(B)	High Temperature	MIL-STD-810C Method 501.1, Procedure II the temperature for step 4 shall be 70°C.
(C)	Humidity	MIL-STD-810C, Method 507.1, procedure II.
(D)	Altitude	MIL-STD-810C, Method 500.1 Procedure I. Non-operational 40000-foot exposure of not less than 1 hour.
(E)	Vibration	MIL-STD-810C, Method 514.2 Procedure VIII, Part 1.
(F)	Shock	
(G)	Bench Handling	MIL-STD-180C, Method 510.1 Procedure 1.
(H)	Dust	MIL-STD-180C, Method 510.1 Procedure 1.
(I)	Salt Fog	MIL-STD-180C, Method 509.1 Procedure 1.
(J)	Fungus	MIL-STD-810C, Method 508.2 (no operational test is required).

3.2.6 Electromagnetic Compatability

The R/E shall be designed and constructed to be in compliance with the requirement of MIL-STD-461A as applicable. The following tests are applicable:

CE06
CS03
RE01
RS03
CS04
RE02
CS05

3.3 Design and Construction

The R/E shall conform with all applicable requirements of MIL-STD-454 and MIL-E-4158 for design and construction. All features required to meet performance requirements shall be incorporated even though the features may not be specifically described herein.

3.3.1 Materials, Processes and Parts

The materials, parts, and process requirements of MIL-STD-454 and MIL-E-4158 shall apply as requirements of this specification.

403.3.1.1 Integrated Electronics

Parts described by Military Specifications, Military Standards, and parts previously designed for military application shall be used to the maximum extent possible, parts shall be procured from vendors having current qualification approval (QPL) for the specified parts to be used.

3.3.1.1.1 Toxic Products and Formulations

Toxic products and formulations shall not be used in the receiver/exciter.

3.3.1.2 Non-Standard Parts

The use of non-standard parts shall be minimized. Non-standard parts approval, in accordance with MIL-E-4158 is required.

3.3.1.3 Parts Application

The pertinent operational and non-operational stresses applied to all parts shall be reviewed and documented. The reviews shall give consideration to the following factors:

A. Inherent part quality and reliability

B. Application stresses and tolerances imposed by equipment design.

C. Assurance that equipment performance shall not depend on unspecified part characteristics.

D. The effects of specified part parameter tolerances, including aging environment.

E. Adequate derating for reliability requirements.

F. Effects of environment with special attention givent o localized thermal and mechanical stresses.

3.3.1.4 Semiconductor Devices

The choice, specification, and application of semiconductor devices shall be in accordance with MIL-STD-454 Requirement 30, except that germanium devices shall not be used. Maximum use of multisource devices shall be made. Vacuum tubes shall not be used in the receiver/exciter.

3.3.1.5 Microelectronic Devices

The selection and application of microelectronic devices shall bei n accordance with MIL-STD-454, Requirement 64. Information required to support computer programs for programmed microelectronic devices (Firmware) shall be provided in accordance with the Contract Data Requirements List (CDRL).

3.3.1.6 Relays

Electronic switches shall be used in the place of electromechanical relays. Coaxial (RF) relays are excluded from this exemption provided that the specific relays used are rated for a minimum of 10 million operations.

3.3.1.7 Circuit Protection

To the maximum extent possible circuit breakers of other resettable type devices shall be used in circuits that require overload protection. Fuses shall not be used unless no other type protective device will function properly and then only with consent of the government.

3.3.2 Nameplates and Product Marking

Nameplate and product markings shall be in accordance with MIL-STD-454, Requirement 67. Marking of printed wiring boards shall conform to MIl_STD-454, Requirement 17. Warning and accident prevention marking shall be permanently attached to the radio set.

3.3.2.1 Nomenclature

Nomenclature shall be obtained in accordance with MIL-STD-454, Requirement 34. Officially assigned nomenclature shall be obtained prior to its use on nameplates, drawings, and in technical data and shall be

used strictly as assigned. Names used throughout this specification are synonymous with the following nomenclature:

Name	Nomenclature
Receiver/Exciter	Receiver-Transmitter RT-1512/G
ECCM Module	Controller, Receiver-Transmitter C-11670/G

3.3.3 Workmanship

Workmanship shall be in accordance with MIL-STD-454, Requirement 9. Soldering shall be in accordance with MIL-STD-454, Requirement 5.

3.3.4 Interchangeability

All parts having the same manufacturer's part number shall be functionally and dimensionally interchangeable. The item identification and part number requirements of DOD-D-1000 shall govern the manufacturer's part numbers and changes thereto. interchangeable items shall be in accordance with Requirement 7, of MIL-STD-454.

3.3.5 Safety

3.3.5.1 Safety of Personnel

The design of the R/E shall provide maximum convenience and safety to personnel in operating and maintaining the equipment. Safety shall conform to the requirements of MIL-E-4158, and MIL-STD-454, Requirement 1. Equipment malfunction shall in no way contribute to the destruction of the equipment or any part of its environment.

3.3.6 Human Engineering

Human engineering shall be in accordance with MIL-STD-454, Requirement 62.

3.3.6.1 Adjustment Range of Controls

The adjustment range of operator and maintenance controls shall be designed to preclude damage to the R/E or its subassemblies when adjusted to the limits of the control travel. The range of control shall be designed to reduce the sensitivity and criticality of the adjustment task to the maximum extent possible.

3.3.6.2 Module Keying

Modules and electrical connectors shall be so constructed that operator/maintenance personnel cannot induce failures by interchange of module types.

3.3.7 Corrosion Prevention

Corrosion prevention and control shall be in accordance with MIL-STD-1250.

3.3.8 Burn-In Test Requirements

The receiver/exciter shall be submitted to an 84-hour burn-in sequence consisting of: a one-hour preliminary test period, eight (8) 10-hour environmental operating cycles, a one-hour period for the chamber and equipment to return to room temperature, and a two-hour final test period. Each cycle shall consist of the following:

A. a chamber heating period with equipment power on

B. a four-hour period with equipment operating, chamber temperature at the highest operating temperature (H.O.T.=+***TBD**C ±C), with a 10-minute vibration test during the first and third hours of this period and a performance check at the end of the period

C. a chamber cooling period with equipment power off

D. a four-hour period with equipment operating for the third and fourth hours, chamber temperature at the lowest operating temperature (L.O.T.=-**TBD**C ±2C), with a 10-minute vibration test during the first and third hours of this period and a performance check at the end of the period

One hour is allowed for the transitions between H.O.T. and L.O.T., as shown by the dashed lines. The minimum allowable chamber temperature change during this period is 5 degrees Celsius per minute (5C/min). The vibration tests consist of a minimum of ten (10) minutes of sinusoidal vibration at a non-resonant frequency between 20 and 60 Hz, at a level of 2.2g ± 10% measured at the equipment mounting points.

4.0 Quality Assurance Provisions

4.1 General Provisions

4.1.1 Quality Assurance Program

The contractor shall provide and maintain a written quality program acceptable to Government for supplies and services covered herein. The quality program shall be in accordance with the contract.

4.1.2 Responsibility of Performance

The contractor shall be responsible for the satisfactory performance of all inspections (INSP), analyses (ANA), and tests. The Government reserves the right to perform any of the provisions set forth herein where such provisions are deemed necessary to assure that supplies and services conform to the requirements of this specification.

4.1.3 Facilities

The contractor may use his own or any other facilities suitable for the performance of the quality assurance provisions specified herein unless disapproved by the Government.

4.1.4 Government Verification of Contractor's Quality Assurance Systems

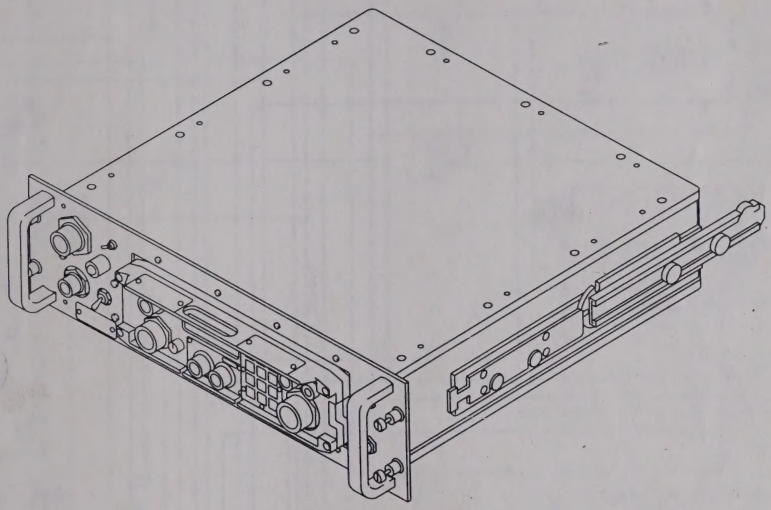
All quality assurance operations performed by the contractor shall consist of, but not be limited to, the following:

A. Surveillance of the operations to determine the practices, methods and procedures of the written system description are bieng properly applied.

B. Government product inspection or test to measure the quality of the radio set to be offered for acceptance. When any contractor furnished component of the radio set is inspected or tested and fails to meet the requirements corrected. Correction of deficiencies observed during inspection or test is the responsibility of the contractor and shall be corrected at no cost to the Government. After correction of discrepancies, all inspection or tests necessary to demonstrate the final configuration of the radio set meets the requirements of this specifaction, shall be

ARMY TM 11-5895-1303-24
NAVY EE162-NG-MMI-010/W110-RT1512G
AIR FORCE TO 31R2-4-562-2

UNIT, INTERMEDIATE DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE MANUAL



RECEIVER-TRANSMITTER RT-1512/G (NSN 5895-01-205-6148)

HOW TO USE THIS MANUAL iii

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INTERMEDIATE DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE 3-1

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DEPARTMENTS OF THE ARMY, THE NAVY, AND THE AIR FORCE

15 MAY 1989

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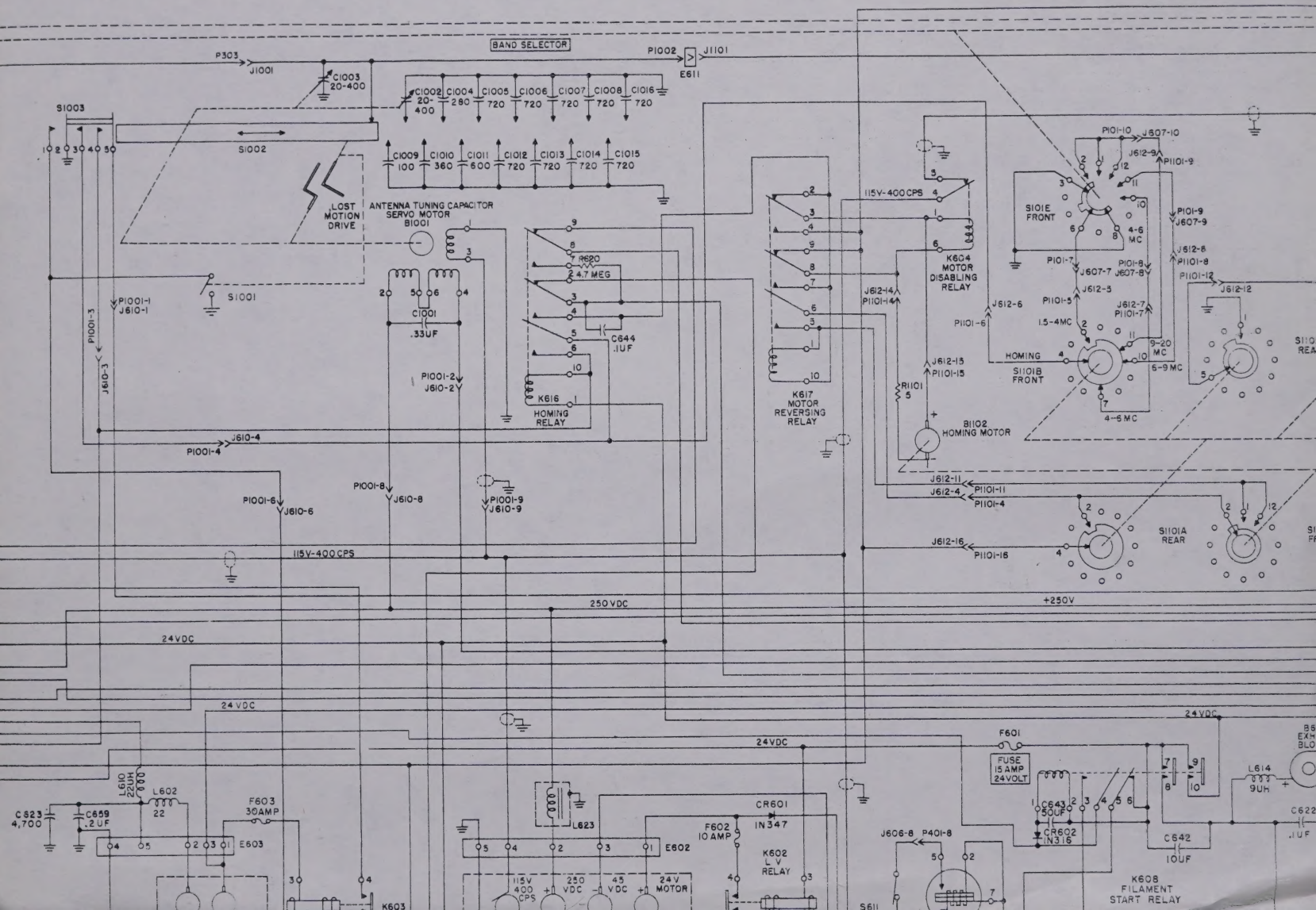
BAND SELECTOR
P303
J1001
C1003 20-400
P1002
J1101
E611
S1003
S1002
C1002 20-400
C1004 280
C1005 720
C1006 720
C1007 720
C1008 720
C1016 720
C1009 100
C1010 360
C1011 600
C1012 720
C1013 720
C1014 720
C1015 720
LOST MOTION DRIVE
ANTENNA TUNING CAPACITOR SERVO MOTOR B1001
S1001
P1001-1
J610-1
P1001-3
J610-3
C1001 .33UF
R620 4.7 MEG
C644 .1UF
P1001-2
J610-2
K616 HOMING RELAY
P1001-4
J610-4
P1001-6
J610-6
P1001-8
J610-8
P1001-9
J610-9
115V-400CPS
250VDC
24VDC
K617 MOTOR REVERSING RELAY
K604 MOTOR DISABLING RELAY
R1101
B1102 HOMING MOTOR
S1101E FRONT
S1101B FRONT
S1101A REAR
4-5 MC
1.5-4MC
9-20 MC
6-9MC
4-5MC
HOMING
+250V
F601
FUSE 15 AMP 24VOLT
L614 9UH
C643 50UF
CR602 IN316
C642 10UF
K608 FILAMENT START RELAY
L610 22UH
L602 22
C623 4,700
C659 .2 UF
F603 30AMP
E603
L623
E602
CR601 IN347
F602 10 AMP
K602 L.V. RELAY
115V 400 CPS
250 VDC
45 VDC
24V MOTOR
K603
S611